Received: 3 December 2020 | Revised: 13 April 2021 | Accepted: 19 May 2021

DOI: 10.1111/jar.12915

ORIGINAL ARTICLE

JARID Journal of Applied Research in Intellectual Disabilities bild WILEY

A quantitative evaluation of a regional Positive Behavioural Support workforce development approach

Karen McKenzie[1] | George Murray[1,2] | Rachel Martin[1] | Aja Murray[3] | Dale Metcalfe[1]

[1]Department of psychology, Northumbria University, Newcastle upon Tyne, UK

[2]NHS Lothian, Edinburgh, UK

[3]Department of psychology, University of Edinburgh, Edinburgh, UK

Correspondence
Karen McKenzie, Department of Psychology, Northumbria University, City Campus, Newcastle upon Tyne NE18ST, UK.
Email: k.mckenzie@northumbria.ac.uk

Funding information
Middlesbrough Council on behalf of Tees Local Authorities, NHS England North East and Cumbria, South Tyneside CCG on behalf of regional CCGs

Abstract

Background: Research suggests that providing staff with input in relation to Positive Behavioural Support (PBS) can have beneficial outcomes. Much of this research, however, fails to take account of systemic issues and does not include a control group.

Method: We used a non-randomised, controlled group design to evaluate accredited PBS programmes, delivered as part of a systemic, regional and workforce development approach. We compared outcomes of those attending the programmes ($n = 240$) with a control group ($n = 54$), pre- and post-intervention and at 3-months follow-up.

Results: The programme and its wider impact were rated positively. Significant intervention effects were found for staff practice and retention, but not for staff knowledge and attributions, or behaviours that challenge and quality of life of those being supported.

Conclusions: The results are discussed in the context of the study limitations and restrictions resulting from the Covid-19 pandemic.

KEYWORDS

autism, behaviours that challenge, impact, intellectual disability, Positive Behavioural Support, quality of life

1 | INTRODUCTION

Positive Behavioural Support (PBS) is a well-established, evidence-based approach that aims to increase the quality of life of people with an intellectual disability, particularly those who present with behaviours that challenge (CB). As a functional approach, PBS views such behaviour as serving a purpose for the person and provides a framework for identifying, understanding and addressing the range of complex factors that can contribute to the expression of CB (Gore et al., 2013). PBS has its basis in applied behaviour analysis and, as the name suggests, is underpinned by a positive, person-centred value base. These principles, such as respect for the individual and the use of non-punitive approaches, have been identified as key to good-quality support by people with an intellectual disability and their families (McKenzie et al., 2017, 2018).

Despite this, some people with an intellectual disability continue to be subject to abusive and restrictive practices, as exemplified by the Winterbourne View scandal. As a result, the 'Transforming Care' agenda (NHS England, 2014) identified the need to develop high-quality, community-based support. A key requirement for the success of this policy is to ensure that staff have appropriate values, knowledge and competence to provide this support.

There is a body of evidence demonstrating that providing staff with input in relation to PBS can have beneficial outcomes. A review by MacDonald and McGill (2013) of 14 studies found reductions in levels of CB, improvements in staff knowledge and in behaviour support plans, changes in causal attributions about, and emotional reactions to, CB. The duration of the input varied across the reviewed studies from a single day of training, to 10 h per week over a year. The format also varied, from predominantly didactic teaching, to role play and practice-based assignments. Most of the studies used a repeated measures design, with only one being noted by the authors as having a control group.

Subsequent research, with staff working in community settings, has also shown positive results, again using different types of input. Wills et al. (2013) reported on an evaluation of input comprising five core PBS modules for half a day per week for 5 weeks. They found that social care staff showed significant improvements in attributions about 'controllability', that is, the extent to which the CB was under the control of the person with an intellectual disability, PBS knowledge, helping behaviours and optimism about reducing CB. Rose et al. (2014) also reported significant improvements in care staff attributions about 'controllability' and attitudes, following 1 day of training, which was 'embedded in a PBS approach' (p39). Significant improvements in knowledge, attributions and in some attitude domains were also found by Wardale et al. (2014). This followed a 4-day programme, delivered over 4–6 weeks, with practice-related activities and ongoing support from the trainers. Stocks and Slater (2016) evaluated a six and a half-day PBS informed course. The authors found increases in staff scores on self-efficacy and positive outcome expectations in relation to their understanding, functional assessment and management of CB, and creating and implementing a PBS plan. None of these studies included a control group.

More recent research has, however, not always found significant changes as a result of PBS input to staff. Hassiotis et al. (2018) reported no significant differences in outcomes, including in CB and use of psychotropic medication, between staff who had received PBS input and those who had not. In this case, the input comprised three 2-day workshops, delivered over a 15-week period, the content of which was supported by a manual. The staff also received support, on at least a monthly basis, by a mentor for a year.

Similarly, MacDonald et al. (2018) found changes in only some of the areas that they measured. In this case, the authors used a non-randomised control group design to evaluate a year-long university accredited programme, which consisted of an initial 2-day workshop followed by eight 1-day workshops delivered at 8-week intervals. Participants were service managers and each session had associated tasks to embed the learning in practice. The authors found a significant reduction in CB, but no changes in the quality of life of those being supported. There were also no significant changes on any of the staff measures. These included staff knowledge and attributions, implementation of active support, quality of staff support and engagement with the people they supported.

Many researchers in this area are increasingly highlighting the importance of systemic factors in the success or otherwise of providing PBS input to staff. These include level of managerial support and commitment, the extent of work-based support, levels of staff turnover, workload demands and communication between team members (Bosco et al., 2019; Hassiotis et al., 2018; MacDonald et al., 2018; McKenzie et al., 2005),

The need for PBS approaches to take into account the wider systems and contexts within which staff, organisations and those being supported operate, henceforth referred to as 'systemic factors', has been highlighted over many years (Allen et al., 2013; Denne et al., 2015; McGill et al., 2018; Olivier-Pijpers et al., 2019). PBS applied as a systemic framework for broader service delivery and change appears to be more frequent in countries other than the United Kingdom (UK), such as the United States. Here, it is generally referred to as Positive Behaviour Interventions and Support and is commonly introduced on a school-wide basis to enhance behavioural and academic outcomes for children and young people (e.g., Grasley-Boy et al., 2020).

By contrast, PBS input to staff in the United Kingdom, who support people with an intellectual disability, has largely been delivered based on a staff training model, most commonly taking the form of short training courses that have a focus on the individual learner. More recently, however, researchers have begun to take account of systemic factors and to explore alternative models of delivering input. For example, McGill et al. (2018) developed standards, in collaboration with services, that addressed areas that have been found to influence CB. In addition to areas such as activities and skill development, health, communication and relationships, some organisational factors were included under the areas of 'service management', and 'wider organisation'. These included supervision, leadership, management, payment and induction of staff. The researchers then worked with services over an 11-month period to help them achieve the standards as part of their intervention. The extent to which this was successful was included as an outcome measure. The authors found that the average percentage of standards that were achieved, post-intervention, was 80.3%, for service management and 68% for wider organisation targets.

Similarly, MacDonald et al. (2018) developed a cascade model of training that took place over 12 months, whereby it was expected that managers would disseminate their learning to their staff teams. As noted above, the only significant change was a decrease in CB of those being supported. The authors suggest that this may be because levels of service user engagement and of staff assistance were already high prior to the intervention, allowing little scope for change.

The present paper reports on one aspect of a region-wide, whole-system, PBS approach, which was underpinned by a workforce development (WFD) model. In contrast to staff training approaches, WFD recognises and takes account of the different contexts in which staff work and services are delivered, as well as the organisational, structural, attitudinal and other factors that influence the individual learner (Denne et al., 2015; Jacobs & Hawley, 2009). The model was influenced by the results of a scoping exercise across the North East

and Cumbria (McNall et al., 2016) that identified a range of areas that could act as barriers to the successful implementation of PBS. These included limited or no emphasis on PBS in commissioning or monitoring requirements, and limited provision of standardised, transferable, input that was assessed or accredited.

This resulting WFD model involved engaging stakeholders, including commissioners, care organisations, NHS staff, families and people with an intellectual disability, to develop a systemic PBS approach (see McKenzie, McNall, et al., 2021 for details). One strand of this approach was a collaboration between NHS and university staff to develop and deliver three accredited PBS programmes to social care staff in the region who supported people with an intellectual disability and/or autism. An independent evaluation of the programme was also commissioned.

An initial qualitative evaluation of the impact of the wider PBS approach, based on feedback from a range of stakeholders (McKenzie, Martin, et al., 2020) found that it was seen as having resulted in many benefits for people with an intellectual disability, individual staff, teams and organisations. The reported benefits included improvements in staff practice and knowledge; the adoption of better staff recruitment, supervision and performance management approaches; a reduction in staff turn-over and sickness and improved quality of life of the people being supported by the organisations.

The present study reports on a further quantitative evaluation of the PBS programme and aims to evaluate whether the PBS programme, in the context of a regional, system-wide WFD approach to PBS, resulted in benefits that were consistent with those reported in the qualitative evaluation.

2 | METHOD

2.1 | Ethics statement

Ethical approval for the study was obtained from the first author's university ethics committee. All those taking part provided informed consent.

2.2 | Design

The study adopted a non-randomised, controlled group design, comparing those who had attended the PBS programme (hereafter referred to as the PBS group), with a control group of those who had not, on a range of outcome measures. Data were collected at three time points: prior to the start of the PBS programme (baseline), at the end of the programme (follow-up 1) and 3 months after the programme ended (follow-up 2). The evaluation was structured based on the updated Learning Evaluation model outlined by Kirkpatrick and Kirkpatrick (2006), as depicted in Table 1. This table also illustrates how each component was measured, who completed the measures, and at which time points.

2.3 | Participants

Participants were from organisations across the North East and Cumbria regions in the United Kingdom, which provided community-based support to people with an intellectual disability and/or autism, and who had committed to supporting the PBS WFD approach. Participants were included in the PBS group if they had attended the PBS programme. As the number of places available to each organisation was limited, to allow equity of access, the control group participants were those who were unable to be offered a place on the programmes during the period of the evaluation.

In total, 299 individuals participated, of whom 240 were in the PBS group and 54 were in the control group. The group status of five participants was missing. Both groups comprised staff working in social care/day care organisations and roles ranged from service managers/organisational leads to front-line support staff. Of the total sample, 241 participants reported that they provided direct support on a regular basis to a person with an intellectual disability and/or autism (194 = PBS group, 46 = control group, 1 = missing data). Table 2 provides the demographic information for the two staff groups and the people they supported.

2.4 | Intervention

The intervention was the PBS programmes. The programmes used a blended learning approach, with participants receiving 3 days of face-to-face teaching for each module that they undertook, access to online materials and activities relating to each topic, and ongoing practice-based support and supervision. The online materials were completed individually by participants, while face-to-face teaching took place in a group setting. The programmes led to one of three accredited qualifications. Organisational leads and managers completed a Postgraduate Certificate or Advanced Diploma in 'Leading PBS', team leaders and other senior staff completed a Certificate in 'Facilitating PBS in teams' and front-line support staff completed an 'Award of competence in PBS'. The first two awards comprised three modules and the third comprised two modules. All modules lasted for 3 months. Table 3 outlines the structure and topic areas in relation to each of the awards.

The provision of support and supervision was based on a cascade model. Three WFD managers, who were experienced PBS practitioners, provided input into the programmes, as well as individual supervision and support to staff in their local areas across the region. The aim of this was to help the participants to apply their learning in practice. The amount and type of support varied according to the needs of the individual, but could include modelling good practice, providing guidance in relation to areas such as the functional analysis of behaviour, and data collection and analysis. In addition, those who had completed the 'Leading PBS' award

TABLE 1 The four levels of learning evaluation outlined by Kirkpatrick and Kirkpatrick (2006) as applied to the PBS programme evaluation

Level	Description	Area being measured	Measures used	Completed by	When completed
Reaction	The extent to which the participants feel the input is of good quality and worthwhile	Ratings of the quality of teaching, supervision, and the PBS programme overall	Bespoke rating scale.	PBS group	Follow-up 1
Learning	The extent to which the input has positively influenced areas such as knowledge and self-efficacy	Knowledge about important factors in the effective management of behaviours that challenge	Bespoke single question coded in accordance with the PBS Competence Framework	PBS and control groups	Baseline, follow-ups 1 and 2
		Staff self-reported self-efficacy	Challenging Behaviour Self-Efficacy Scale		
		Changes in staff attributions	Challenging Behaviour Attributions Scale		
Behaviour	The extent to which learning is applied in practice	Changes in practice, as reflected in relation to: • the development, understanding and implementation of behaviour support plans	Periodic service review model—adapted for the study		
		• the extent to which behaviour support plans reflected positive approaches and were based on a functional assessment and understanding of behaviour	Bespoke rating scale		
Results	The wider impact of the PBS programme	In relation to people with an intellectual disability and/or autism: • Levels of behaviours that challenge	Staff report -bespoke measure		
		• Quality of life	GCPLAR—total score 1. GCPLAR—social activities score 2. Bespoke quality of life measure		
		In relation to staff: • Stress • Psychological well-being	Perceived Stress Scale WEMWS—seven-item scale		
		• Turn-over	Bespoke measure. Staff report of job status, that is, left job, actively seeking a new job, in the same job.		Follow-ups 1 and 2
		• Ratings of the impact of the PBS programme	Bespoke rating scale developed for the study	PBS group	

Abbreviations: GCPLAR, Guernsey Community Participation and Leisure Assessment—Revised; PBS, Positive Behavioural Support.

provided support and supervision to those undertaking the 'Facilitating PBS in teams' award. These staff then provided this, in turn, to the front-line staff who were completing the 'Award of Competence' in PBS. There were both academic and competency-based assessments included as a part of the programmes to address staff learning about the theoretical basis of PBS as well as their implementation of this in practice (see McKenzie, Martin, et al., 2020 for further details about the programmes). The team delivering the PBS programmes was the same throughout the period of the evaluation.

2.5 | Measures

The measures used for each level of the Learning Evaluation model are outlined below and summarised in Table 1. Measures that were

TABLE 2 Demographic information for the PBS and control groups

PBS group						Control group				
	Number (%)									
Gender	Male		Female			Male		Female		
	62 (25.8)		178 (74.2)			14 (25.9)		40 (74.1)		
Ethnic origin	White British/British		Other			White British/British		Other		
	232 (97.9)		5 (2.1)			51 (100)		0 (0)		
Previous PBS training	Yes		No			Yes		No		
	116 (57.1)		87 (42.9)			29 (58)		21 (42)		
Age (years)	Mean (SD)		Range			Mean (SD)		Range		
	40.6 (10.8)		19–63			43.4 (10.8)		24–64		
Years working in intellectual disability services	12.3 (8.5)		0.5–35			10.4 (7.8)		.5–34		
Role	Direct Support	Managerial	Team Leader	Other		Direct support	Managerial	Team Leader		Other
	109 (48.4)	88 (39.1)	16 (7.1)	12 (5.3)		28 (54.9)	11 (21.6)	9 (17.6)		3 (5.9)
Qualification	School level	Vocational	Degree/postgraduate	Other	None	School level	Vocational	Degree/postgraduate	Other	None
	0 (17.6)	117 (51.5)	55 (24.2)	14 (6.2)	1 (.4)	12 (23.5)	25 (49)	12 (23.5)	0 (0)	2 (3.9)
	Demographic information in relation to those being supported by participants									
Age (years)	Mean (SD)		Range			Mean (SD)		Range		
	36.4 (14.5)		13–74			40.1 (14.2)		19–76		
Gender	Male		Female	Other		Male		Female	Other	
	104 (61.5)		64 (37.9)	1 (.6)		32 (84.2)		6 (15.8)	0 (0)	
Level of intellectual disability	Mild	Moderate	Severe	Profound	Unknown	Mild	Moderate	Severe	Profound	Unknown
	15 (9.5)	33 (20.9)	42 (26.6)	1 (.6)	67 (42.4)	2 (5.7)	12 (34.3)	7 (20)	1 (2.9)	13 (37.1)

Abbreviation: PBS, Positive Behavioural Support; SD, standard deviation.

TABLE 3 Overview of the programme structure and content

	Module 1	Module 2	Module 3
Qualification	Shared topics across all three qualifications		Shared topics across 'Leading PBS' and 'Facilitating PBS in teams'
	Timeline of how people with disabilities have been devalued Valuing people as individuals Quality of life and well-being Origins and influences of PBS Essential features of PBS Behaviour happens for a reason Role of Consequences Behaviour Support Plans Role of Proactive Strategies Role of Preventative Strategies Role of Reactive Strategies	Introduction to FBA	Interactive Training Feedback: The breakfast of champions Stress in carers Promoting resilience in the workforce
Leading PBS	Module 1: Principles of PBS (14 topics)	Module 2: Applying PBS in Practice (11 topics)	Module 3: Leading PBS in Organisations (11 topics)
	Shared topics as outlined above, and additional topics below:		
	A functional understanding why behaviour occurs What is the evidence for the use of PBS? Critiques of PBS	What is motivation? Process of FBA Undertaking FBA Gathering and using data Direct observation Synthesising data Basing interventions on FBA data Options in FBA? Behaviour skills training Active Support	Leading PBS in organisations PBS and performance management Identifying your Mission Assessing what carers do The literature on changing staff behaviour Systems analysis Positive psychology and flourishing
Facilitating PBS in teams	Module 1: Foundations of PBS (13 topics)	Module 2: PBS in Practice (10 topics)	Module 3: Facilitating PBS in teams (10 topics)
	Shared topics as outlined above, and additional topics below		
	Understanding behaviours that challenge What is PBS? Why use PBS	Motivation and behaviour FBA—Defining behaviour Gathering information Keeping data Now what? How to understand your data Planning support strategies Teaching new skills Using behaviour support plans Monitoring outcomes	Introduction Front-line leadership Interactive training Assessing staff Performance Monitoring the effectiveness and quality of support Quality of life and reducing restrictive practices Understanding systems and putting it all together
Award of competence in PBS	As for the 'Facilitating PBS in teams' award, but with no third module		

Abbreviations: FBA, Functional-Based Assessment; PBS, Positive Behavioural Support.

developed for the project (see Table 1) do not have information available about their psychometric properties. Measures were completed individually by participants online, unless otherwise specified.

2.6 | 'Reaction'

The PBS group rated the quality of the teaching, supervision and overall programme on a 6-point scale (very poor = 1 and very good = 6), with a higher score indicating better perceived quality.

2.7 | 'Learning'

2.7.1 | Self-efficacy

This was measured using the 'Challenging Behaviour Self-Efficacy Scale' (Hastings & Brown, 2002). This is rated on a 7-point scale and the response to each question is added to give a total score (range 5–35), with a higher score indicating greater feelings of self-efficacy in relation to managing CB. This scale has been found to have good internal reliability ($\alpha = .81$: Hutchinson et al., 2014).

2.7.2 | Attributions

These were measured using the 'Challenging Behaviour Attributions Scale' (Hastings, 1997). Participants rate the likelihood of different casual explanations for CB (learned behaviour, biomedical, emotional, environmental and stimulation) from very likely to very unlikely. The average score for each category is calculated (range −2 to 2). A score less than 0 indicates that the person thinks the particular category is unlikely to be the cause of the behaviour, while a score above 0 indicates the person thinks it is applicable. The internal reliability of the scales ranges between $\alpha = .65$ and .74 (Tynan & Allen, 2002).

2.7.3 | Knowledge about responses to CB

This was measured by asking participants to provide an open-ended written responses to a question, which asked them what they thought were the best ways to successfully manage CB. Participants' written responses were coded in accordance with the PBS Competence Framework (Positive Behavioural Support Coalition UK, 2015). For example, a response that included the phrase 'Put in proactive strategies to ensure an individual has a meaningful and good quality of life' would receive the codes of PR, indicating that proactive strategies had been identified and VL to indicate the response was values-led. Each relevant code received a score of 1. If the code was repeated in the response, only 1 point was given. Fifty percent of responses were coded by two raters to help ensure consistency, and differences in coding were resolved through discussion. The possible range of scores was between 0 and 32.

2.8 | 'Behaviour'

2.8.1 | PBS in practice

The practice of a subgroup of participants who supported a person who displayed CB was assessed in relation to that person's behaviour support plan. This was an individual assessment conducted with the participant. The assessment was structured in line with a periodic service review model (La Vigna et al., 1994) and was adapted from that used by McKenzie et al. (2002). The assessed categories included: a description of the nature and identified function of the target behaviour(s); how this was recorded and reviewed; the proactive and reactive strategies that were used to support the person; any functionally equivalent behaviours that the person was taught; any other factors that were taken into account, for example, the person's physical health; how the plan was reviewed and the involvement of the person being supported in the plan. Possible scores ranged between 0 and 28, with a higher score indicating better practice.

Each participant was also rated on the extent to which their responses evidenced that the behaviour support plan overall: reflected positive approaches; was based on observable and measurable behaviour and had responses related to, and which were consistent with, the identified function of, discrete target behaviours. Participants could score between 5 and 25 points, with a higher score indicating a more robust plan. The assessment was conducted by an experienced clinical psychologist, who was blind to the group status of the participants.

2.9 | 'Results'

2.9.1 | Ratings of impact

Participants in the PBS group rated the impact of the PBS programme on a range of factors (see Table 4), from extremely positive = 5 to extremely negative = 1.

2.9.2 | Participants' views on CB

Participants reported on the number of topographies of CB and the frequency with which each type of CB displayed by the main person they supported had occurred in the previous month. No independent observations or interobserver agreement were gathered for these outcome measures.

2.9.3 | Quality of life of those being supported

This was evaluated in two ways. In both cases, the participants reported on the quality of life of the main person that they supported. The 'Guernsey Community Participation and Leisure Assessment—Revised' (GCPLAR: Baker et al., 2016) measures frequency of community use and other activities. It provides domain scores and a total score (possible range 0–230). A higher score indicates greater engagement in activities. In line with previous researchers (see Bowring et al., 2020), the 'social activities' subscale was analysed separately to provide an indication of quality of life, specifically in relation to community participation. The GCPLAR is reported to have acceptable psychometric properties (Baker et al., 2016).

In addition, a measure was designed for the project, which included questions that related to the 'Five Accomplishments' (O'Brien, 1992) and the categories identified in the 'Seven Keys to Citizenship' (Duffy, 2006). The areas covered in relation to the former were as follows: Respect, Relationships, Competence, Choice and Community Presence. The areas addressed in the latter were as follows: Direction/Purpose, Freedom, Money, Home, Help, Life and Love. The measure has 48 items, which are scored 'yes' or 'no' (range 0–48), with higher scores indicating a greater quality of life.

2.9.4 | Work-related stress

This was measured using the 10-item 'Perceived Stress Scale' (Cohen et al., 1983). This has acceptable psychometric properties (Lee, 2012).

TABLE 4 The mean score and SD for the PBS and control groups for the variables explored in each of the levels outlined Kirkpatrick and Kirkpatrick's (2006) learning evaluation model

Category and measures	PBS group			Control group		
	Baseline Mean (SD)	Follow-up 1 Mean (SD)	Follow-up 2 Mean (SD)	Baseline Mean (SD)	Follow-up 1 Mean (SD)	Follow-up 2 Mean (SD)
	'Reaction'					
Quality of the teaching		5.7 (.57)				
Quality of the supervision	n/a	5.1 (1.2)	n/a	n/a	n/a	n/a
Overall experience of the programme		5.6 (.76)				
	'Learning'					
Self-efficacy	24.8 (5.5)	27.7 (4.0)	27.3 (3.6)	25.3 (4.3)	26.9 (3.8)	27.8 (4.9)
Learned negative and positive attribution	1.0 (.56)	1.2 (.66)	1.0 (.68)	.98 (.62)	.83 (.36)	.60 (1.1)
Responses to behaviours that challenge	2.5 (1.7)	4.1 (2.3)	3.6 (1.6)	2 (1.2)	2.8 (1.6)	2.2 (.75)
	'Behaviour'					
Behaviour support plan practice	41.0 (34.0)	66.6 (39.5)	83.9 (28.2)	41.8 (31.8)	35.3 (36.4)	52.2 (40.4)
Behaviour support plan response ratings	8.0 (5.7)	13.7 (8.1)	17.9 (5.3)	7.7 (4.9)	7.5 (5.7)	11.6 (5.3)
	'Results'					
Work-related stress	16.1 (5.5)	15.2 (5.7)	14.8 (5.9)	15.0 (6.4)	13.5 (6.9)	10.7 (5.8)
Psychological Wellbeing	23.9 (3.3)	23.1 (3.7)	22.8 (3.2)	24.1 (4.5)	22.8 (3.5)	24.4 (1.9)
Impact on those being supported		4.5 (.54)	4.5 (.56)			
Impact on practice		4.5 (.55)	4.6 (.54)			
Impact on knowledge		4.7 (.46)	4.7 (.47)			
Impact on stress		3.8 (.93)	3.8 (.88)			
Impact on organisational policy	n/a	4.2 (.73)	4.1 (.77)	n/a	n/a	n/a
Impact on organisational strategy		4.2 (.72)	4.2 (.73)			
Impact on commissioning and tendering for services		3.9 (.78)	3.9 (.86)			
Impact on sharing good practice		4.6 (.54)	4.5 (.58)			
Total number of behaviours that challenge	3.8 (1.8)	3.1 (1.8)	3.5 (1.5)	3.6 (1.9)	3.8 (1.5)	4 (1.7)
Mean frequency behaviours that challenge	3.9 (1.8)	3.1 (1.8)	3.4 (1.5)	3.6 (1.9)	3.8 (1.5)	4.0 (1.7)
Quality of life total score	43.2 (3.3)	44.5 (2.7)	43.6 (2.7)	43.6 (2.8)	43.4 (2.9)	42.3 (3.1)
GCPLAR—social activities score	12.9 (6.6)	13.8 (6.0)	13.0 (6.2)	11.6 (5.2)	13.6 (7.9)	12 (7.9)
GCPLAR total score	74.8(26.6)	77.3 (24.6)	81.7 (28.8)	72.2(20.1)	77.3(34.5)	82.7 (33.2)

Abbreviations: GCPLAR, Guernsey Community Participation and Leisure Assessment—Revised; PBS, Positive Behavioural Support; SD, standard deviation.

Participants rate their stress-related thoughts and feelings on a 5-point scale (never to very often). Total scores can range from 0 to 40, with a higher score indicating greater stress. Participants were asked to respond to the questions in relation to their work.

2.9.5 | Psychological well-being

This was measured using the 7-item version of the Warwick-Edinburgh Mental Wellbeing Scale (Stewart-Brown et al., 2009). This has acceptable psychometric properties (e.g., Ng Fat et al., 2017). Participants rate positively worded items on a 5-point scale, with a higher score indicating better mental well-being.

2.9.6 | Staff retention

Participants reported at follow-up whether they remained in the same job, were actively seeking a new job or had left their previous job.

Participants were also asked to provide some basic demographic information, to indicate whether they provided direct support on a regular basis to a person with an intellectual disability and/or autism and, if so, to provide some information about their current systems of data collection in relation to CB.

Different participants completed different aspects of the evaluation. Table 5 illustrates the number of participants in each group, completing each type of measure at each time point.

TABLE 5 The number of participants in each group, completing each type of measure at each time point

	PBS group			Control group		
	Baseline	Follow-up 1	Follow-up 2	Baseline	Follow-up 1	Follow-up 2
Type of measure	Number completing some measures within each category					
Online measures applicable to all staff	197	102	86	48	15	12
Online measures for those providing direct support	147	61	44	37	13	12
Interview	62	22	21	28	10	8

Abbreviation: PBS, Positive Behavioural Support.

2.10 | Procedure

The participating organisations identified potential participants from staff who would be enrolling in the PBS programme during the period of the evaluation and a control group of staff who would not. Both groups were contacted by email and/or phone, provided with information about the evaluation and invited to take part. Those who were interested in participating were emailed a link to the online evaluation. This provided more detailed information about the study. Participants provided consent by clicking on a link in the survey. They were then asked to provide an identifying code before completing the relevant online measures. Once participants had completed the relevant measures, they were redirected to a separate survey where they were asked for their name and code. This code was used to match responses over the three time points of the evaluation.

A subgroup of those who provided direct support were contacted and invited to take part in the assessment relating to staff practice. These were conducted by a clinical psychologist/researcher with extensive experience of working in intellectual disability services.

Participants were sent the links to the online survey and arrangements were made to conduct the practice assessments, where applicable, at the two subsequent follow-up points.

2.11 | Data analysis

The impact of the PBS intervention on most of the intervention study outcomes was tested using a series of multi-level models (MLMs). For each outcome, an MLM was fit in which time was included as a level-1 predictor and group (intervention versus control) as a level-2 predictor. Random intercepts and random slopes for time were included in the model. To test whether the intervention led to a relative increase in the outcomes over time, a group-by-time interaction was specified. The statistical significance of this parameter was used to indicate whether the intervention had an effect on a given outcome. Models were estimated using maximum likelihood estimation using the lme4 package (Bates et al., 2014) in R statistical software (R Core Team, 2017).

Multi-level multiple imputation with $m = 100$ imputations was used to deal with missing data in the outcome variables. The full mixed effects model approach described by Grund et al. (2016) was used. This method can be described as an example of a joint modelling approach (in contrast to fully conditional specification approaches) in which a single model is used for imputing all incomplete variables simultaneously. In our application of the approach, we used a separate imputation model (and associated imputed datasets) for each MLM. In each case, the imputation model used was identical to the analysis model. Between 10,000 and 20,000 burn-in iterations were used depending on convergence. Convergence was checked using the potential scale reduction statistic, which we required to be 1.05. Parameter estimates and standard errors were then pooled using Rubin's rules (Rubin, 2004). This method provided unbiased parameter estimates provided that data are missing at random (Rubin, 1976). All multi-level imputation steps were implemented using the pan and mitml packages in R statistical software (Grund et al., 2016; Grund, Lüdtke, & Robitzsch, 2018; Grund, Robitzsch, & Luedtke, 2018).

3 | RESULTS

3.1 | Participant group differences

There were no significant differences between the PBS and control groups at baseline, in respect of demographic and other variables (see Table 6).

3.2 | Outcome measures

The results are presented according to the Learning Evaluation model. Table 4 illustrates the range, mean scores and standard deviation (SD) for the PBS and control groups for the variables explored in each of the levels, with the exception of staff turn-over, the results of which are reported separately.

Table 7 presents the results for the MLMs. In all these cases, the results are for the group-by-time interaction in the MLM (i.e., comparing the PBS and control group scores over time). Ideally, from a theoretical standpoint to avoid potential spurious detection of group-by-time interactions, it would have been ideal to include the random effects for time for all analyses (Barr, 2013). However, it was necessary to remove the random effect for time due to convergence issues in some of the imputed datasets, for all but the following outcome variables: self-efficacy, behaviour support plan response ratings and mean number of CB. For these outcomes, results must be interpreted more cautiously.

3.3 | 'Reaction'

3.3.1 | Quality of the PBS programme

Participants rated the teaching, supervision and overall programme very positively.

3.4 | 'Learning'

3.4.1 | Attributions, self-efficacy and responses to CB

No significant intervention effects were found in relation to attributions, self-efficacy scores or responses to CB.

TABLE 6 The comparisons between the PBS and control groups at baseline on demographic and other factors

Variable	Result of comparison
Age	$t(286) = -1.67$, $p = .095$
Gender	$\chi^2 = .0002$, df = 1, $p = .989$
Years working in intellectual disability services	$t(250) = 1.41$, $p = .16$
Previous PBS training	$\chi^2 = .012$, df = 1, $p = .913$
Ethnic origin	$\chi^2 = 1.1$, df = 1, $p = .295$
Level of qualification	$\chi^2 = 8.78$, df = 5, $p = .118$
Type of role (coded as support worker or not)	$\chi^2 = .694$, df = 1, $p = .405$
Age of person being supported	$t(160) = -.666$, $p = .507$
Gender of person being supported	$\chi^2 = 3.39$, df = 2, $p = .184$
Level of intellectual disability of person being supported	$\chi^2 = .308$, df = 4, $p = .989$

Abbreviation: PBS, Positive Behavioural Support.

3.5 | 'Behaviour'

3.5.1 | Behaviour support plans

Significant intervention effects were found, with the PBS group having a greater increase in scores for both the behaviour support plan practice score and response ratings.

3.6 | 'Results'

3.6.1 | Impact of the PBS programme

The mean scores indicate that the participants reported that the PBS programme had a positive impact on all of the factors identified at both follow-up 1 and follow-up 2.

3.6.2 | Work-related stress and psychological well-being

There was no statistically significant difference between the two groups over time on stress or well-being. The PBS group rated the PBS programme as having a positive impact on work-related stress.

3.7 | Behaviours that challenge

At baseline, only 47.2% and 33.3% of the PBS and control groups, respectively, had recording methods for CB that were updated on at least a daily basis and summarised on at least a weekly basis. This suggests that the baseline data on CB are likely to be somewhat inaccurate for some participants. No significant intervention effects were found in relation to the number or frequency of CB.

TABLE 7 The results from the MLM for the group-by-time interaction

Analysis	*t* Value	Degrees of freedom	*p* Value
Self-efficacy	0.29	303.8	.77
Learned positive and negative attributions	−0.822	205.8	.41
Responding to behaviours that challenge	1.66	196.2	.09
Behaviour support plan practice score	3.23	299.5	.001
Behaviour support plan response ratings	3.46	217.8	.001
Work-related stress	1.07	209	.287
Psychological well-being	0.219	205.2	.827
Behaviours that challenge—mean number	−0.29	174	.774
Behaviours that challenge—mean frequency	−0.159	207.5	.874
Quality of life	−0.279	201.9	.781
Overall activities	0.45	152.6	.653
Social activities	0.094	136.5	.92

Abbreviation: MLM, multi-level model.

TABLE 8 The number and percentage of participants, who remained in their job, were actively seeking another job or left their job at follow-ups 1 and 2

	PBS group		Control group	
	Follow-up 1 ($n = 138$) Number (%)	Follow-up 2 ($n = 106$) Number (%)	Follow-up 1 ($n = 43$) Number (%)	Follow-up 2 ($n = 35$) Number (%)
Remained in job	125 (90.6)	94 (88.7)	30 (69.8)	20 (57.1)
Left job	4 (2.9)	9 (4.9)	9 (20.9)	12 (34.3)
Actively seeking another job	9 (6.5)	3 (1.6)	4 (9.3)	3 (8.6)

Note: The number of those who left their job at follow-up 1 is also included in the total figure for those who have left their job by follow-up 2.
Abbreviation: PBS, Positive Behavioural Support.

3.8 | Quality of life

No significant intervention effects were found in the reported quality of life of those being supported, as measured by the quality of life measure designed for the study, the GCPLAR social activities scores or GCPLAR total scores.

3.9 | Staff retention

Table 8 illustrates the number and percentage of participants who remained in their job, were actively seeking another job or left their job at follow-up. A series of chi-square tests indicated a significant association between group and leaving work/actively seeking another job, with fewer of those participants in the control group remaining in their job, as compared with the PBS group. This result was found at follow-up 1 ($\chi^2 = 11.4$, df $= 1$, $p = .001$) and follow-up 2 ($\chi^2 = 16.7$, df $= 1$, $p < .001$).

4 | DISCUSSION

The evaluation of the PBS was structured using the four levels of learning evaluation outlined by Kirkpatrick and Kirkpatrick (2006). The results in respect of each area are discussed below.

In terms of 'reaction' to the PBS programme, the teaching, supervision and overall experience were rated highly by the PBS group participants. The success of the programme, in this respect, may be because it combined important elements that have been found to be effective in WFD, that is, 'classroom'-based teaching, practice leadership and workplace coaching (Bosco et al., 2019; van Oorsouw et al., 2009).

Three areas were explored in relation to 'learning'—self-efficacy, attributions and knowledge about the best ways to manage CB. No significant intervention effect was found for any of these areas in the present study. Some previous research has found positive changes in attributions (see MacDonald et al., 2018) and self-efficacy following PBS training (e.g., Stocks & Slater, 2016), although this latter study did not include a control group. In general, previous studies have shown PBS training to result in increased staff knowledge, although many of these did not include a control group (MacDonald & McGill, 2013). More recent research by MacDonald et al. (2018), that did include a control group, found that PBS input appears to have a differential impact on staff, depending on their role. They found that managers experienced increases in their knowledge, compared to the control group, while the staff they managed did not. It may be that the overall results of the current evaluation masks any differences in knowledge between groups with different roles. Unfortunately, the small number of staff in the control group, precluded further analysis of this data by role.

It has been highlighted that, while improvements in areas such as knowledge and attributions are positive, they will not necessarily lead to changes in staff behaviour and in the support provided (MacDonald et al., 2018). Our evaluation found significant intervention effects in the outcome measures relating to staff practice, with increases over time in the intervention group compared with the control group. There have only been a few studies that have explored the impact of PBS input on staff practice. MacDonald et al. (2018) used a periodic service review approach to measure staff practice but did not find any significant change. McGill et al. (2018) worked with staff to develop, implement and monitor practice according to a set of standards. The researchers found significant changes in practice as measured by achieving the standards. Neither of these studies, however, included a control group for the aspect of the study that explored changes in practice.

The wider 'results' of the PBS programme were evaluated in a number of different ways. The impact of the programme, as rated by the PBS group, indicated that they perceived it to have had a positive impact on those they supported, on themselves as individuals, and on their organisations. These results were consistent with those highlighted in a qualitative evaluation of the programme (McKenzie, Martin, et al., 2020).

In relation to CB, no significant intervention effects were found. Previous research has found that PBS input has resulted in improvements in CB (e.g., MacDonald et al., 2018; MacDonald & McGill, 2013); however, Hassiotis et al. (2018) found no significant effect. Our own results may have been influenced by the fact that fewer than half of those in both groups had robust methods for recording CB at baseline. This suggests that the majority of the baseline data was likely to be inaccurate to some extent, meaning that

some of the subsequent comparisons were also likely to be invalid. The method used in the study, that is, online reporting of CB, may also not be a valid way of accurately measuring changes in CB, as it requires staff to obtain this information from their existing recording systems (which may be inaccurate, as discussed previously) or to base their judgement on memory, which is also unlikely to be reliable.

No significant intervention effects were found in relation to quality of life. These results are consistent with previous research, with a review by MacDonald and McGill (2013) finding limited evidence for PBS input having a measurable impact on quality of life. This is supported by more recent research that has failed to find significant improvements in quality of life (Hassiotis et al., 2018) or in engagement in activities (MacDonald et al., 2018) following PBS input for staff. These results may be for a number of different reasons. This may include the lack of an appropriate quality of life measure for individuals with an intellectual disability who display CB (Townsend-White et al., 2012); pre-existing high levels of activities (MacDonald et al., 2018) and quality of life, meaning there is limited scope for improvement or the need for more comprehensive and specifically tailored interventions for individuals, that are delivered over a longer period of time than the follow-up period in the present study allowed.

There was some concern expressed during the development of the PBS programme that taking part in an accredited programme and evaluation, in addition to working, might increase the stress levels of the PBS group. This concern appears to be unfounded, with no significant differences between the PBS and control groups in work-related stress or well-being over time being evidenced. In addition, the staff in the PBS group were significantly more likely to still be in their job at follow-up, in comparison to the control group. This suggests that the PBS programme had a significant, positive effect on staff retention. Previous research has found that providing staff with clear processes and feedback as part of high-quality supervision and support is associated with reduced staff turn-over (e.g., Kozak et al., 2013; Vassos et al., 2013), and these were important elements of the PBS programme.

The evaluation had a number of strengths and limitations, which must be taken into account when considering the results. A particular strength of the PBS programme was that it was part of a wider WFD approach, which took account of the context within which the participants worked. This approach is consistent with the long-identified need for a systemic approach to the development, implementation, support and evaluation of PBS (Allen et al., 2013; McGill et al., 2018; Olivier-Pijpers et al., 2019).

This strength also, however, created challenges for the evaluation. The changes being implemented across the region were widespread, because of the systemic nature of the WFD approach and the cascade model on which the PBS programme was founded. This meant that staff in the control group were likely to be influenced to some extent by them too. This is likely to have been compounded during follow-up 2, when the effects of the Covid-19 pandemic resulted in staff being moved between services to cover staff shortages. Control group staff may have found themselves working in services where staff had received PBS input and vice versa. This is likely to have impacted on the results of the evaluation. In addition, because the participating organisations determined who would be offered places on each cohort of the programme, the participants were not randomly allocated to the PBS or control groups by the researchers.

A further consideration is that the Covid-19 restrictions impacted on many of the areas being measured in the study at follow-up 2, such as the activities and quality of life of those who were being supported by staff. Changes in staffing and routines may also have resulted in increases in CB for some people. Some of the measures taken at follow-up 2, may not, therefore, be representative.

The Covid-19 pandemic also contributed to a further limitation of the evaluation—the small number of control group participants that completed some aspects of the evaluation, particularly at follow-up 2. Staff absences and redeployment meant that many were unavailable at follow-up 2 or were no longer supporting the person that they had completed the evaluation in relation to at baseline. This impacted on both groups but had a greater effect on the control group because it was smaller to begin with. The follow-up period of the evaluation was also relatively short and combined with the negative effects of the Covid-19 restrictions may not have been sufficiently long to demonstrate significant improvements in CB and quality of life.

A final important limitation was that most of the evaluation was based on information provided by the staff and some measures were developed for the purpose of the study and, therefore, their psychometric properties are unknown. Many of those being supported had a severe or profound intellectual disability and/or limited verbal communication, which made the measures used in the study unsuitable for them. This highlights the need to develop more creative and accessible ways for people with communication difficulties to provide their views about the support they receive.

As a result of these limitations, some of the results can only be considered to be preliminary. Future research that adopts a randomised control group design, a longer follow-up period, and that does not take place at a time when there are widespread, externally imposed restrictions on activities and social interactions will help to provide more robust evidence.

5 | CONCLUSION

Despite these limitations, the evaluation provides evidence that the PBS programme, in the context of the wider WFD model, provided high-quality teaching and supervision, with associated improvements in PBS behaviour support plans and practice and staff retention.

ACKNOWLEDGEMENTS

The authors are grateful to all those participants who took part in the evaluation, to Daniel Rippon for his early input into the evaluation and to all members of the PBS Steering Group, past and present, in particular Steve Noone, Anne McNall, Judith Thompson, Kirsty Greenwell, Alison Branch, Melissa Sherring, Jill Chaplin and Lynne Jones.

CONFLICT OF INTEREST

None.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available on request from the corresponding author.

ORCID

Karen McKenzie https://orcid.org/0000-0002-0400-416X
Dale Metcalfe https://orcid.org/0000-0001-8146-0233

REFERENCES

Allen, D., McGill, P., Hastings, R. P., Toogood, S., Baker, P., Gore, N. J., & Hughes, J. C. (2013). Implementing positive behavioural support: Changing social and organisational contexts. *International Journal of Positive Behavioural Support*, *3*, 32–41.

Baker, P., Taylor-Roberts, L., & Jones, F. (2016). *The Guernsey Community Participation & Leisure Assessment—Revised (GCPLA-r)*. Canterbury Tizard Centre, University of Kent. https://doi.org/10.13072/midss.95

Barr, D. J. (2013). Random effects structure for testing interactions in linear mixed-effects models. *Frontiers in Psychology*, *4*, 328. https://doi.org/10.3389/fpsyg.2013.00328

Bates, D., Mächler, M., Bolker, B., & Walker, S. (2014). Fitting linear mixed-effects models using lme4. ArXiv Preprint ArXiv:1406.5823.

Bosco, A., Paulauskaite, L., Hall, I., Crabtree, J., Soni, S., Biswas, A., … Crawford, M. J. (2019). Process evaluation of a randomised controlled trial of PBS-based staff training for challenging behaviour in adults with intellectual disability. *PLoS One*, *14*, e0221507. https://doi.org/10.1371/journal.pone.0221507

Bowring, D. L., Totsika, V., Hastings, R. P., & Toogood, S. (2020). Outcomes from a community-based positive Behavioural support team for children and adults with developmental disabilities. *Journal of Applied Research in Intellectual Disabilities*, *33*, 193–203. https://doi.org/10.1111/jar.12660

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health and Social Behavior*, *24*, 386–396. https://doi.org/10.2307/2136404

Denne, L., Jones, E., Lowe, K., Brown, F. J., & Hughes, J. C. (2015). Putting positive behavioural support into practice: The challenges of workforce training and development. *International Journal of Positive Behavioural Support*, *5*, 43–54. https://doi.org/10.1111/1467-9604.12053

Duffy, S. (2006). *Keys to citizenship. A guide to getting good support for people with learning disabilities* (2nd ed.). The Centre for Welfare Reform.

Gore, N. J., McGill, P., Toogood, S., Allen, D., Hughes, J. C., Baker, P., … Denne, L. D. (2013). Definition and scope for positive behavioural support. *International Journal of Positive Behavioural Support*, *3*, 14–23.

Grasley-Boy, N. M., Reichow, B., van Dijk, W., & Gage, N. (2020). A systematic review of tier 1 PBIS implementation in alternative education settings. *Behavioral Disorders*. https://doi.org/10.1177/0198742920915648

Grund, S., Lüdtke, O., & Robitzsch, A. (2016). Multiple imputation of multilevel missing data. *SAGE Open*, *6*, 215824401666822. https://doi.org/10.1177/2158244016668220

Grund, S., Lüdtke, O., & Robitzsch, A. (2018). Multiple imputation of missing data for multilevel models: Simulations and recommendations. *Organizational Research Methods*, *21*, 111–149. https://doi.org/10.1177/1094428117703686

Grund, S., Robitzsch, A., & Luedtke, O. (2018). *Mitml: Tools for multiple imputation in multilevel modeling*. R Package Version 0.3-6.

Hassiotis, A., Poppe, M., Strydom, A., Vickerstaff, V., Hall, I. S., Crabtree, J., … Cooper, V. (2018). Clinical outcomes of staff training in positive behaviour support to reduce challenging behaviour in adults with intellectual disability: Cluster randomised controlled trial. *The British Journal of Psychiatry*, *212*(3), 161–168. https://doi.org/10.1192/bjp.2017.34

Hastings, R. P. (1997). Measuring staff perceptions of challenging behaviour: The challenging behaviour attributions scale (CHABA). *Journal of Intellectual Disability Research*, *41*, 495–501. https://doi.org/10.1111/j.1365-2788.1997.tb00742.x

Hastings, R. P., & Brown, T. (2002). Behavior problems of autistic children, parental self-efficacy and mental health. *American Journal on Mental Retardation*, *107*, 222–232. https://doi.org/10.1352/0895-8017(2002)107<0222:BPOCWA>2.0.CO;2

Hutchinson, L. M., Hastings, R. P., Hunt, P. H., Bowler, C. L., Banks, M. E., & Totsika, V. (2014). Who's challenging who? Changing attitudes towards those whose behaviour challenges. *Journal of Intellectual Disability Research*, *58*, 99–109. https://doi.org/10.1111/j.1365-2788.2012.01630.x

Jacobs, R. L., & Hawley, J. D. (2009). Emergence of workforce development: Definition, conceptual boundaries, and implications. In R. MacLean & D. Wilson (Eds.), *International handbook of education for the changing world of work* (pp. 2537–2552). Springer. https://doi.org/10.1007/978-1-4020-5281-1_167

Kirkpatrick, D., & Kirkpatrick, J. (2006). *Evaluating training programs: The four levels*. Berrett-Koehler Publishers.

Kozak, A., Kersten, M., Schillmöller, Z., & Nienhaus, A. (2013). Psychosocial work-related predictors and consequences of personal burnout among staff working with people with intellectual disabilities. *Research in Developmental Disabilities*, *34*, 102–115. https://doi.org/10.1016/j.ridd.2012.07.021

La Vigna, G. W., Willis, T. J., Shaull, J. F., Abedi, M., & Sweitzer, M. (1994). *The periodic service review: A total quality assurance system for human services and education*. Paul H. Brookes. https://doi.org/10.1177/154079699401900409

Lee, E. H. (2012). Review of the psychometric evidence of the perceived stress scale. *Asian Nursing Research*, *6*, 121–127. https://doi.org/10.1016/j.anr.2012.08.004

MacDonald, A., & McGill, P. (2013). Outcomes of staff training in positive behaviour support: A systematic review. *Journal of Developmental and Physical Disabilities*, *25*, 17–33. https://doi.org/10.1007/s10882-012-9327-8

MacDonald, A., McGill, P., & Murphy, G. (2018). An evaluation of staff training in positive behavioural support. *Journal of Applied Research in Intellectual Disabilities*, *31*, 1046–1061. https://doi.org/10.1111/jar.12460

McGill, P., Vanono, L., Clover, W., Smyth, E., Cooper, V., Hopkins, L., … Davis, S. (2018). Reducing challenging behaviour of adults with intellectual disabilities in supported accommodation: A cluster randomized controlled trial of setting-wide positive behaviour support. *Research in Developmental Disabilities*, *81*, 143–154. https://doi.org/10.1016/j.ridd.2018.04.020

McKenzie, K., MacLean, H., Megson, P., & Reid, K. (2005). Behaviours that challenge. *Learning Disability Practice*, *8*, 16–19. https://doi.org/10.7748/ldp2005.11.8.9.16.c1644

McKenzie, K., Martin, R., Metcalfe, D., Murray, G. C., McNall, A., & Noone, S. (2020). 'Look, all our hard work is paying off': A qualitative evaluation of a system wide, workforce development model to promote positive Behavioural support. *Journal of Applied Research in Intellectual Disabilities*, *33*, 1512–1522. https://doi.org/10.1111/jar.12778

McKenzie, K., Mayer, C., Whelan, K., McNall, A., Noone, S., & Chaplin, J. (2017). The views of carers about support for their family member with an intellectual disability: With a focus on positive Behavioural approaches. *Health & Social Care in the Community*, *26*, e56–e63. https://doi.org/10.1111/hsc.12475

McKenzie, K., McNall, A., Noone, S., Branch, A., Murray, G. C., Sherring, M., Jones, L., Thompson, J., & Chaplin, J. (2021). The use of a workforce development approach as a methodological framework:

The implementation of region wide positive Behavioural support. *Journal of Applied Research in Intellectual Disabilities*, *34*(3), 675–683.

McKenzie, K., Sharp, K., Paxton, D., & Murray, G. C. (2002). The impact of training and staff attributions on staff practice in learning disability services. *Journal of Learning Disabilities*, *6*, 239–251. https://doi.org/10.1177/1469004702006003034

McKenzie, K., Whelan, K., Mayer, C., McNall, A., Noone, S., & Chaplin, J. (2018). "I feel like just a normal person now": An exploration of what is important for people with intellectual disabilities in the provision of positive behavioural support. *British Journal of Learning Disabilities*, *46*, 241–249. https://doi.org/10.1111/bld.12236

McNall, A., McKenzie, K., & Branch, A. (2016). *Scoping the workforce development needs of health and social care providers delivering Positive Behavioural Support for those with learning disabilities across the North East and Cumbria for the Workforce Development Task and Finish group of Transforming Care Programme*. https://tinyurl.com/y4c85fzq.

Ng Fat, L., Scholes, S., Boniface, S., Mindell, J., & Stewart-Brown, S. (2017). Evaluating and establishing national norms for mental wellbeing using the short Warwick–Edinburgh mental well-being scale (SWEMWBS): Findings from the health survey for England. *Quality of Life Research*, *26*, 1129–1144. https://doi.org/10.1007/s11136-016-1454-8

NHS England. (2014). *Winterbourne View—Time for change: Transforming the commissioning of services for people with learning disabilities and/or autism*. https://tinyurl.com/golmgjt.

O'Brien, J. (1992). Developing high quality services for people with developmental disabilities. In V. J. Bradley & H. A. Bersani (Eds.), *Quality assurance for individuals with developmental disabilities*. Baltimore, MD.

Olivier-Pijpers, V. C., Cramm, J. M., & Nieboer, A. P. (2019). Influence of the organizational environment on challenging behaviour in people with intellectual disabilities: Professionals' views. *Journal of Applied Research in Intellectual Disabilities*, *32*, 610–621. https://doi.org/10.1111/jar.12555

Positive Behavioural Support Coalition UK. (2015). *Positive behavioural support: A competence framework*. https://tinyurl.com/tymb99t.

R. CORE Team. (2017). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing. www.R-Project.Org

Rose, J., Gallivan, A., Wright, D., & Blake, J. (2014). Staff training using positive behavioural support: The effects of a one-day training on the attributions and attitudes of care staff who work with people with an intellectual disability and challenging behaviour. *International Journal of Developmental Disabilities*, *60*, 35–42. https://doi.org/10.1179/2047387713Y.0000000020

Rubin, D. B. (1976). Inference and missing data. *Biometrika*, *63*, 581–592. https://doi.org/10.1093/biomet/63.3.581

Rubin, D. B. (2004). *Multiple imputation for nonresponse in surveys* (Vol. 81). John Wiley & Sons. https://doi.org/10.1002/9780470316696

Stewart-Brown, S., Tennant, A., Tennant, R., Platt, S., Parkinson, J., & Weich, S. (2009). Internal construct validity of the Warwick-Edinburgh mental well-being scale (WEMWBS): A Rasch analysis using data from the Scottish health education population survey. *Health and Quality of Life Outcomes*, *7*, 1–8. https://doi.org/10.1186/1477-7525-7-15

Stocks, G., & Slater, S. (2016). Training in positive behavioural support: Increasing staff self-efficacy and positive outcome expectations. *Tizard Learning Disability Review*, *21*, 95–102. https://doi.org/10.1108/tldr-04-2015-0020

Townsend-White, C., Pham, A. N. T., & Vassos, M. V. (2012). A systematic review of quality of life measures for people with intellectual disabilities and challenging behaviours. *Journal of Intellectual Disability Research*, *56*(3), 270–284. https://doi.org/10.1111/j.1365-2788.2011.01427.x

Tynan, H., & Allen, D. (2002). The impact of service user cognitive level on carer attributions for aggressive behaviour. *Journal of Applied Research in Intellectual Disabilities*, *15*, 213–223. https://doi.org/10.1046/j.1468-3148.2002.00120.x

van Oorsouw, W. M., Embregts, P. J., Bosman, A. M., & Jahoda, A. (2009). Training staff serving clients with intellectual disabilities: A meta-analysis of aspects determining effectiveness. *Research in Developmental Disabilities*, *30*, 503–511. https://doi.org/10.1016/j.ridd.2008.07.011

Vassos, M., Nankervis, K., Skerry, T., & Lante, K. (2013). Work engagement and job burnout within the disability support worker population. *Research in Developmental Disabilities*, *34*, 3884–3895. https://doi.org/10.1016/j.ridd.2013.08.00

Wardale, S., Davis, F., Carroll, M., & Vassos, M. (2014). Outcomes for staff participating in positive behavioural support training. *International Journal of Positive Behavioural Support*, *4*, 10–23.

Wills, S., Shephard, J., & Baker, P. (2013). Evaluating the impact of positive behaviour support training on staff knowledge, attributions, emotional responses and helping behaviour: Capturing hearts and minds. *International Journal of Positive Behavioural Support*, *3*(1), 31–39.

How to cite this article: McKenzie, K., Murray, G., Martin, R., Murray, A., & Metcalfe, D. (2021). A quantitative evaluation of a regional Positive Behavioural Support workforce development approach. *Journal of Applied Research in Intellectual Disabilities*, *34*(6), 1641–1654. https://doi.org/10.1111/jar.12915